

MATERIAL SAFETY DATA SHEET

9135-00

SECTION 1 - MATERIAL IDENTIFICATION

**MATERIAL NAME:** Helium, Liquid

**Description:** Colorless, odorless, inert; supplied as cryogenic liquid in special insulated containers.

**MANUFACTURER:** U.S. Bureau of Mines  
Helium Field Operations  
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SECTION 2 - HAZARDOUS INGREDIENTS

**HELIUM (He)** >99%

**Other components:** <1%

TLV: Simple Asphyxiant\*

\*ACGIH (1981) TLV for simple asphyxiant gases is a minimum atmospheric O<sub>2</sub> content of 18% by volume at atmospheric pressure.

SECTION 3 - PHYSICAL DATA

**Normal Boiling Point, deg C:** -268.9

**Melting Point, deg C:** -272.0 at 2555 kPa

**Vapor density (air=1):** 0.138 at 101 kPa, 20 °C, 13.6 at NBP

**Molecular Weight:** 4.003

**Appearance:** Colorless, odorless cryogenic liquid

JSC MSDS # 9612

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

**Nonflammable.** Use extinguishers suited to surrounding fire.

**Dewars may burst when heated.** Use water spray to cool heated dewars.

**Material will not support combustion or life.** Firefighters should use self-contained breathing equipment.

SECTION 5 - REACTIVITY DATA

Cryogenic liquid can be stored at low temperature in an insulated, vented container. Liquid helium condenses and solidifies all other gases. Oxygen from air will condense on uninsulated, exposed surfaces. Liquified oxygen could become a fire hazard. Solidified air or ice from atmospheric moisture could block container vents. Use only materials compatible with cryogenic temperatures. (Carbon steel is brittle at the temperature of liquid helium.)

## SECTION 6 - HEALTH HAZARD DATA

Non-toxic. In closed areas gasified liquid helium can displace oxygen. If atmospheric oxygen content drops below 18%, asphyxiation can occur.

Symptoms can include panting, gasping, fast pulse, clumsiness, bluish fingernails and/or lips, confusion, dizziness, fatigue, nausea, vomiting, collapse, and convulsions.

Contact with liquid helium or the cold gas produced can cause freeze burns.

### FIRST AID:

Contact with liquid or cold gas: Promptly flush affected areas with lukewarm water to reduce freezing of tissue. (Do not apply heat to affected areas!) Apply loose, dry, bulky, sterile dressings to protect from infection or further injury. Have victim exercise affected area while it is being warmed.

Inhalation: (Caution! Rescuers must see to their own safety. Use self-contained breathing equipment to enter areas of possible low oxygen.) Remove victim to fresh air. Quickly restore or support breathing as needed. Give oxygen if available.

Get medical attention for victim promptly.

## SECTION 7 - SPILL, LEAK, AND DISPOSAL PROCEDURES

Major leaks: Vaporizing helium can reduce atmospheric oxygen content below 19% in over 8000 times its volume of air. Evacuate area until a safe oxygen level can be assured. Notify safety personnel immediately. Emergency workers need self-contained breathing equipment and protective clothing against cryogenic liquid.

Minor leaks can be dangerous in closed areas. White boiling vapor can occur close to a liquid helium leak.

Disposal: Move leaking container outdoors or to an exhaust hood with good forced ventilation. Allow gas to vent at a moderate rate. Leaking dewars may shatter violently. Stay away from dewar while venting helium. Tag container as defective and mark defect. Return container to supplier. Follow all state and local regulations.

## SECTION 8 - SPECIAL PROTECTION INFORMATION

Ventilate all enclosed areas where liquid is stored or used to maintain at least 19% oxygen in air. Provide air-supplied or self-contained breathing equipment for workers in emergency or non-routine situations where oxygen level could be unsafe. Use a safety line and a stand-by worker when a worker with a respirator must enter an area with low oxygen. The stand-by worker must have self-contained breathing equipment ready. (Caution! Regular gas masks or canister respirators will not protect. Use may result in asphyxiation.)

Protective clothing including insulating gloves, safety glasses or goggles, and outer garments should be used when handling liquid helium to prevent skin contact with liquid or cold gas. Equipment used in confined spaces should be thoroughly checked for leaks.

## SECTION 9 - SPECIAL PRECAUTIONS

Store in a cool, dry, well-ventilated area with low risk of fire and away from combustible or corrosive chemicals.

Protect containers from physical damage and from heat over 125 °F. Use pressure relief on liquid helium containers that prevent entry of air (backflow of air can freeze to a solid and plug lines or vent.) Check vents on stored liquid containers frequently. Insulated lines must be used to transfer liquid helium.

DOT Classification: NONFLAMMABLE

DOT Label: Nonflammable, Green label

I.D. Number: UN 1963

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